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United States  
Department of  
Agriculture

Soil  
Conservation  
Service

Spokane,  
Washington



# Washington Water Supply Outlook

March 1, 1986





# Foreword

## How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

## For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

| STATE                    | ADDRESS   |
|--------------------------|---|
| Alaska                   | 201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687                  |
| Arizona                  | 201 East Indianola, Suite 200, Phoenix, AZ 85012                        |
| Colorado<br>(New Mexico) | 2490 West 26th Ave., Denver, CO 80211                                   |
| Idaho                    | 304 North 8th Street, Room 345, Boise, ID 83702                         |
| Montana                  | 10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715          |
| Nevada                   | 50 South Virginia Street, Third Floor, Reno, NV 89505                   |
| Oregon                   | 1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204                 |
| Utah                     | 4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147 |
| Washington               | 360 U.S. Court House, Spokane, WA 99201                                 |
| Wyoming                  | Federal Building, 100 East "B" Street, Casper, WY 82602                 |

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

# Washington Water Supply Outlook

and

## Federal — State — Private Cooperative Snow Surveys

### Issued by

Wilson   Scaling  
Chief  
Soil Conservation Service  
Washington, D.C.

### Released by

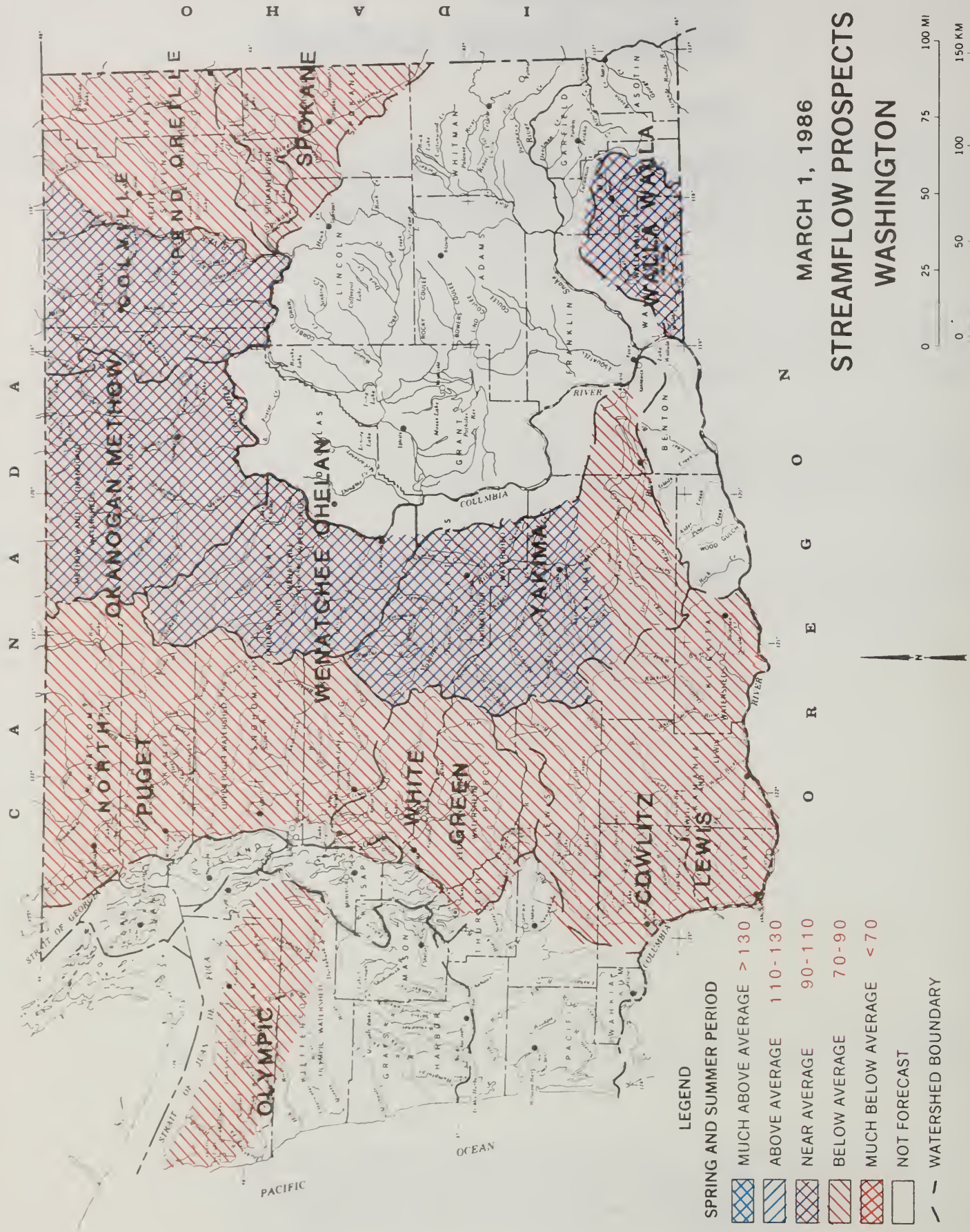
Lynn A. Brown  
State Conservationist  
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### Prepared by

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All programs and services of the USDA  
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or national origin.





SOURCE: Data compiled by SCS  
Field Personnel

## GENERAL OUTLOOK

### SUMMARY:

The snowpack for March 1 is below average except for parts of Wenatchee, Chelan and the Walla Walla drainages. February precipitation was above average. Spring like temperatures were felt statewide during February. The above normal precipitation and near normal temperature had streamflow at or above normal statewide. Reservoir storage showed some improvement statewide. Forecasted stream flows are slightly improved over February.

### SNOWPACK:

March 1 snowpack was varied over Washington with a high of 125% on the Stemilt Creek drainage, and a low of 43% of normal on the Cedar River. The Yakima Basin snowpack is at 87% of average, while the Spokane, Okanogan and Pend Oreille Basins are near 80%. Snowpack around Mt. St. Helens is near 77% of normal. The Puget Sound rivers of the Elwah, Snoqualmie and Baker are below 70% of average.

### PRECIPITATION:

February precipitation was above average for all the basins in the state. Highest was the Walla Walla Basin where 292% of normal fell during the month. The Walla Walla weather station reported 4.12 inches compared to the February average of 1.41. The Wenatchee Basin had 180% of normal precipitation. The lowest was the Olympic Basin where precipitation was 115% of average. Other basin readings were; Spokane 129%, Okanogan 152% Yakima 134%, Cowlitz-Lewis 127% and the North Puget Sound 128%.

### RESERVOIRS:

Reservoir storage improved during February, with the Puget Sound reservoirs at 97% of normal and Chelan Lake at 101% of average. The Yakima reservoirs remain below normal at 80%, storing 555,200 acre feet compared to the average of 697,000 acre feet. The Okanogan reservoirs are at 104% of normal.



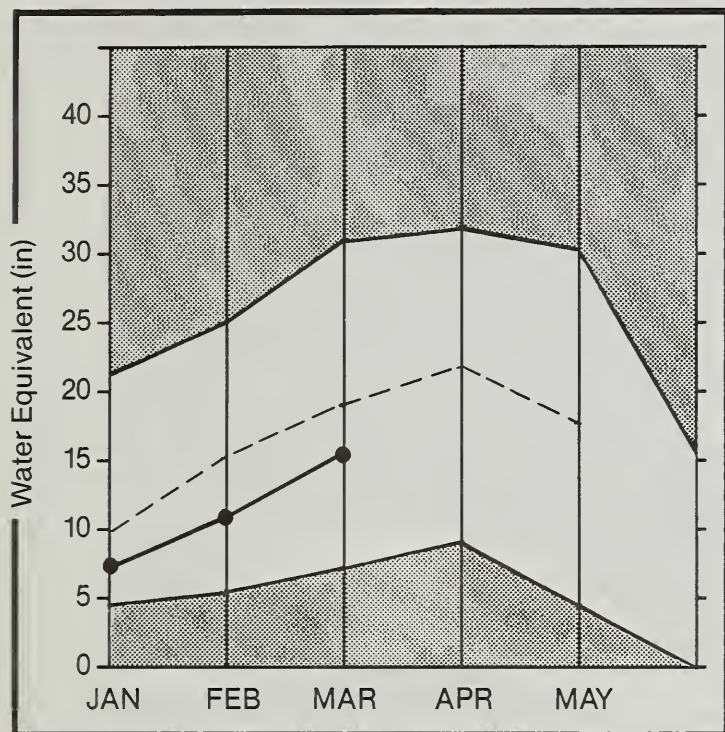
## STREAMFLOW

February streamflow was above normal over most of Washington. Above normal precipitation coupled with above average temperatures allowed much of the low elevation snow to melt. Some February streamflows around the state were; Spokane 102%, Columbia @ the International Boundary 107%, Chelan 114%, Wenatchee 126%, Yakima 96%, Walla Walla 193%, Cowlitz 136% and the Skykomish 159%. Forecasted streamflows for the coming summer are for near average on the eastern side and for below average for western Washington.



# SPOKANE

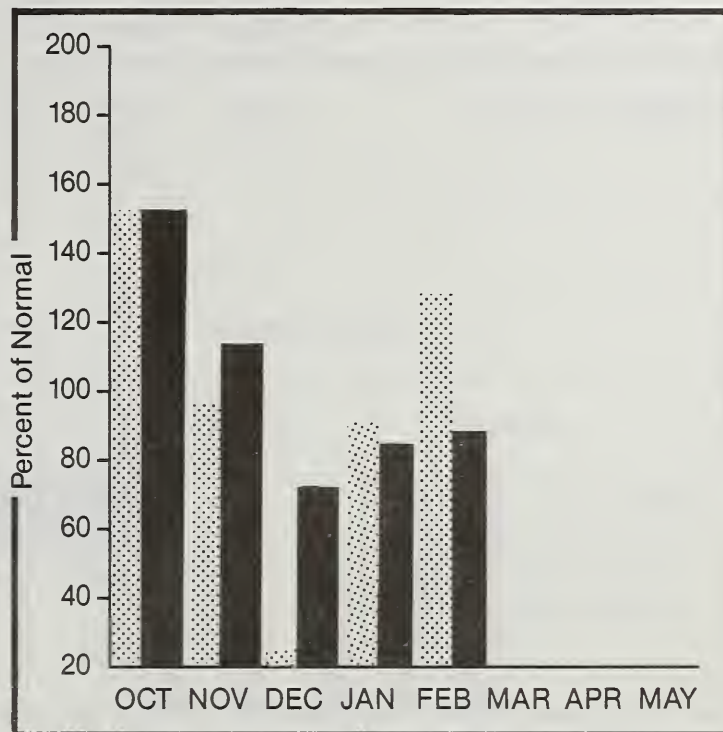
**Mountain snowpack\*** (inches)




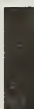
\*Based on selected stations

Maximum  Average   
Minimum  Current 

**Precipitation\*** (percent of normal)



\*Based on selected stations

Monthly precipitation  Year to date precipitation 

## SPOKANE RIVER BASIN

### WATER SUPPLY OUTLOOK:

Snowcover in the Spokane Drainage is 81% of normal for the March 1st measurements. This is up from the 69% for February. February Precipitation was 129% of average, bringing the water year total to 87%. Streamflows are forecasted to be 70% of normal for the summer. Above average precipitation and normal temperatures combined to bring melt to the low elevation snowpack. Streamflow in the Spokane River was 102% of normal at Post Falls. Storage in Coeur d'Alene Lake increased to 129% of normal.

For more information contact your local Soil Conservation Service office.

# SPOKANE RIVER BASIN

## STREAMFLOW FORECASTS

| FORECAST POINT        | FORECAST PERIOD | 20 YR. AVE.<br>(1000AF) | MOST PROBABLE<br>(1000AF) | MOST PROBABLE<br>(% AVE.) | REAS. MAX.<br>(% AVE.) | REAS. MIN.<br>(% AVE.) | PEAK FLOW<br>(CFS) | PEAK DATE | LOW FLOW<br>(CFS) | LOW DATE |
|-----------------------|-----------------|-------------------------|---------------------------|---------------------------|------------------------|------------------------|--------------------|-----------|-------------------|----------|
| SPOKANE at Post Falls | APR-SEP         | 2848.0                  | 2000.0                    | 70                        | 103                    | 37                     |                    |           |                   |          |
|                       | APR-JUL         | 2754.0                  | 1930.0                    | 70                        | 103                    | 37                     |                    |           |                   |          |

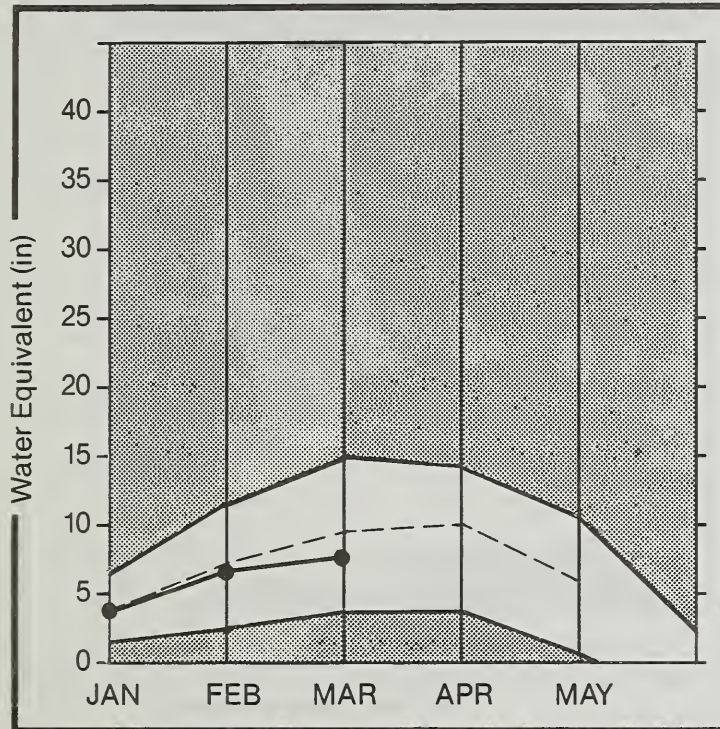
| RESERVOIR STORAGE<br>(1000AF) |                  |           |           |       | WATERSHED SNOWPACK ANALYSIS |                   |                                    |    |
|-------------------------------|------------------|-----------|-----------|-------|-----------------------------|-------------------|------------------------------------|----|
| RESERVOIR                     | USEABLE CAPACITY | THIS YEAR | LAST YEAR | AVE.  | WATERSHED                   | NO. COURSES AVE.D | THIS YEAR AS % OF LAST YR. AVERAGE |    |
| COEUR D'ALENE                 | 225.1            | 283.0     | 19.5      | 142.8 | Spokane River               | 17                | 65                                 | 76 |

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.







# COLVILLE AND PEND OREILLE

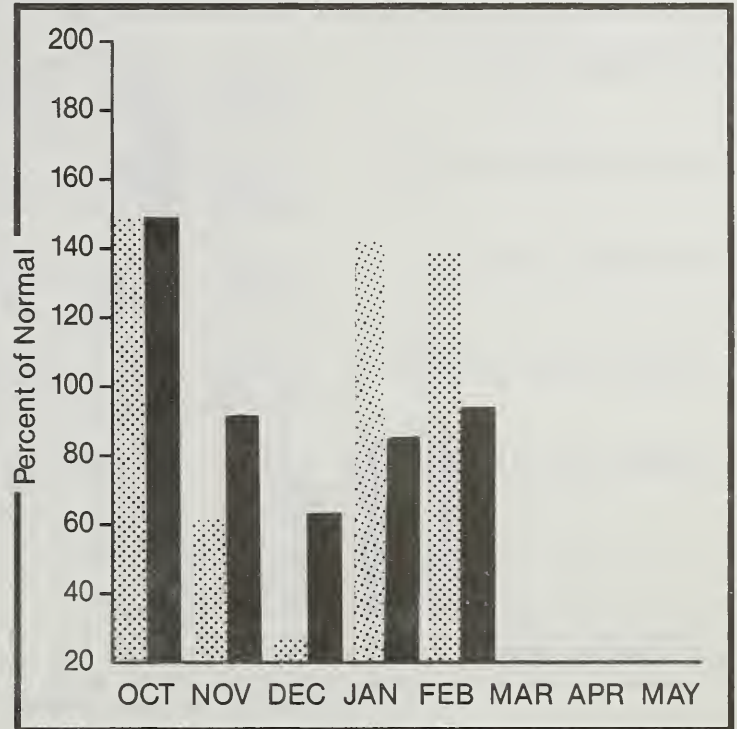
**Mountain snowpack\* (inches)**





\*Based on selected stations

Maximum  Average   
Minimum  Current 

**Precipitation\* (percent of normal)**



\*Based on selected stations

Monthly precipitation  Year to date precipitation 

## COLVILLE - PEND OREILLE RIVER BASINS

### WATER SUPPLY OUTLOOK:

Snowcover improved on the Pend Oreille River from 70% to 78% of normal, but reduced in the Kettle from 95% to 84% and Colville from 85% to 78%. February precipitation was 139% of normal. Streamflows were 114% of average in the Pend Oreille and 134% in the Kettle River. Forecasted streamflows are for 82% in the Pend Oreille, 90% in the Kettle and 80% in the Colville. Streamflows in the Columbia River were at 107% of normal for February and are forecasted to be 93% for the spring and summer.

For more information contact your local Soil Conservation Service office.



# COLVILLE - PEND OREILLE RIVER BASINS

## STREAMFLOW FORECASTS

| FORECAST POINT                   | FORECAST PERIOD | 20 YR. AVE.<br>(1000AF) | MOST PROBABLE<br>(1000AF) | MOST PROBABLE<br>(% AVE.) | REAS. MAX.<br>(% AVE.) | REAS. MIN.<br>(% AVE.) | PEAK FLOW<br>(CFS) | PEAK DATE | LOW FLOW<br>(CFS) | LOW DATE |
|----------------------------------|-----------------|-------------------------|---------------------------|---------------------------|------------------------|------------------------|--------------------|-----------|-------------------|----------|
| PEND OREILLE RIVER b1 Box Canyon | APR-SEP         | 15425.0                 | 12600.0                   | 81                        | 101                    | 63                     |                    |           |                   |          |
|                                  | APR-JUL         | 14156.0                 | 11600.0                   | 81                        | 101                    | 63                     |                    |           |                   |          |
|                                  | APR-JUN         | 12227.0                 | 10100.0                   | 82                        | 102                    | 64                     |                    |           |                   |          |
| COLVILLE RIVER at Kettle Falls   | APR-SEP         | 134.0                   | 107.0                     | 79                        | 129                    | 31                     |                    |           |                   |          |
|                                  | APR-JUL         | 123.0                   | 100.0                     | 81                        | 130                    | 33                     |                    |           |                   |          |
|                                  | APR-JUN         | 114.0                   | 93.5                      | 82                        | 131                    | 33                     |                    |           |                   |          |
| KETTLE RIVER nr Laurier          | APR-SEP         | 1829.0                  | 1650.0                    | 90                        | 122                    | 58                     |                    |           |                   |          |
|                                  | APR-JUL         | 1738.0                  | 1560.0                    | 89                        | 122                    | 58                     |                    |           |                   |          |
|                                  | APR-JUN         | 1581.0                  | 1440.0                    | 91                        | 123                    | 59                     |                    |           |                   |          |
| COLUMBIA RIVER at Birchbank *    | APR-SEP         | 44605.0                 | 44300.0                   | 99                        | 118                    | 80                     |                    |           |                   |          |
|                                  | APR-JUL         | 35705.0                 | 35500.0                   | 99                        | 118                    | 80                     |                    |           |                   |          |
|                                  | APR-JUN         | 26027.0                 | 25770.0                   | 99                        | 118                    | 80                     |                    |           |                   |          |
| COLUMBIA RIVER at Grand Coulee * | APR-SEP         | 66841.0                 | 62200.0                   | 93                        | 106                    | 80                     |                    |           |                   |          |
|                                  | APR-JUL         | 56169.0                 | 52300.0                   | 93                        | 106                    | 80                     |                    |           |                   |          |
|                                  | APR-JUN         | 44036.0                 | 41000.0                   | 93                        | 106                    | 80                     |                    |           |                   |          |

## RESERVOIR STORAGE

(1000AF)

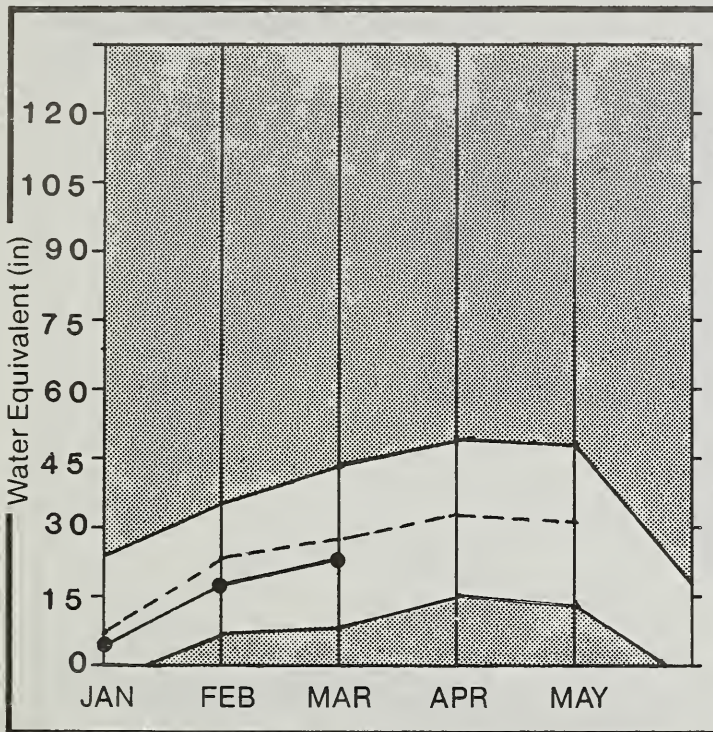
## WATERSHED SNOWPACK ANALYSIS

| RESERVOIR | USEABLE CAPACITY | ** USEABLE STORAGE **<br>THIS YEAR | LAST YEAR | AVE.   | WATERSHED             | NO. COURSES AVE.D | THIS YEAR AS % OF<br>LAST YR. AVERAGE |
|-----------|------------------|------------------------------------|-----------|--------|-----------------------|-------------------|---------------------------------------|
| ROOSEVELT | 5232.0           | 4860.7                             | 2694.0    | 2763.0 | Colville River        | 3                 | 78 78                                 |
| BANKS     | 715.0            | 741.4                              | 674.8     | 606.0  | Pend Oreille River    | 12                | 75 79                                 |
|           |                  |                                    |           |        | Kettle River          | 9                 | 102 83                                |
|           |                  |                                    |           |        | Omac Lake, Twin Lakes | 0                 | 0 0                                   |
|           |                  |                                    |           |        | Newman Lake           | 0                 | 0 0                                   |

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

# OKANOGAN AND METHOW

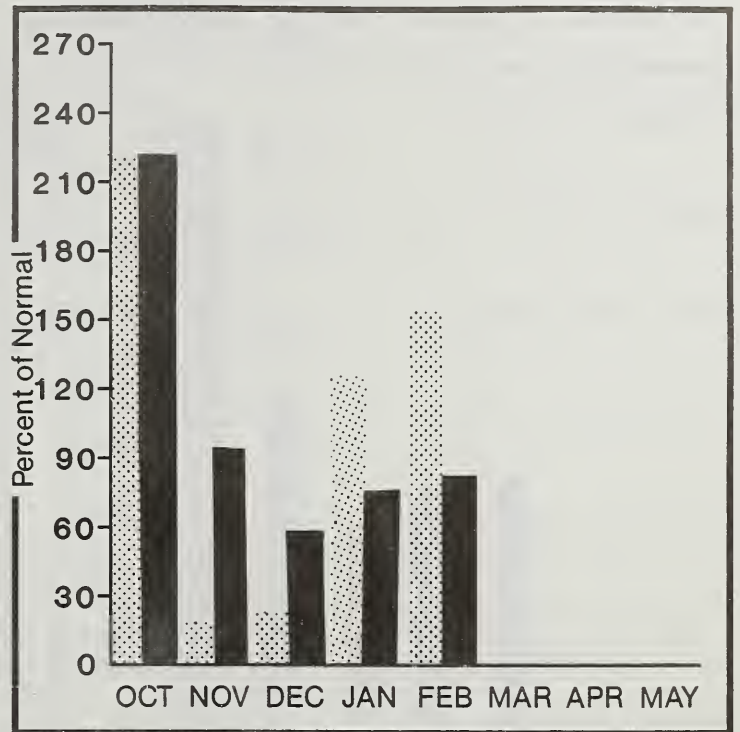
Mountain snowpack\* (inches)



\*Based on selected stations

Maximum Average Minimum Current

Precipitation\* (percent of normal)



\*Based on selected stations

Monthly precipitation Year to date precipitation

## OKANOGAN - METHOW RIVER BASINS

### WATER SUPPLY OUTLOOK:

Precipitation in the Okanogan-Methow Basins was 152% of normal during February. Temperatures averaged degree above normal for the month. Snowcover was 83% of average on the Okanogan and 79% on the Methow River drainages. Reservoir storage is at 104% of the 20 year average, with 14,500 acre feet in storage. Forecasted streamflow for the Okanogan is 95% and on the Methow is 96% of normal.

For more information contact your local Soil Conservation Service office.

# OKANOGAN - METHOW RIVER BASINS

## STREAMFLOW FORECASTS

| FORECAST POINT              | FORECAST PERIOD | 20 YR. AVE. (1000AF) | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVE.) | REAS. MAX. (% AVE.) | REAS. MIN. (% AVE.) | PEAK FLOW (CFS) | PEAK DATE | LOW FLOW (CFS) | LOW DATE |
|-----------------------------|-----------------|----------------------|------------------------|------------------------|---------------------|---------------------|-----------------|-----------|----------------|----------|
| SIMILKAMEEN R. nr Nighthawk | APR-SEP         | 1462.0               | 1400.0                 | 95                     | 124                 | 66                  |                 |           |                |          |
|                             | APR-JUL         | 1365.0               | 1310.0                 | 95                     | 124                 | 66                  |                 |           |                |          |
|                             | APR-JUN         | 1161.0               | 1130.0                 | 97                     | 127                 | 67                  |                 |           |                |          |
| OKANOGAN R. nr Tonasket     | APR-SEP         | 1644.0               | 1560.0                 | 94                     | 129                 | 61                  |                 |           |                |          |
|                             | APR-JUL         | 1497.0               | 1420.0                 | 94                     | 129                 | 61                  |                 |           |                |          |
|                             | APR-JUN         | 1262.0               | 1210.0                 | 95                     | 130                 | 62                  |                 |           |                |          |
| METHOW RIVER nr Pateros     | APR-SEP         | 980.0                | 936.0                  | 95                     | 124                 | 66                  |                 |           |                |          |
|                             | APR-JUL         | 908.0                | 865.0                  | 95                     | 125                 | 65                  |                 |           |                |          |
|                             | APR-JUN         | 773.0                | 745.0                  | 96                     | 126                 | 66                  |                 |           |                |          |

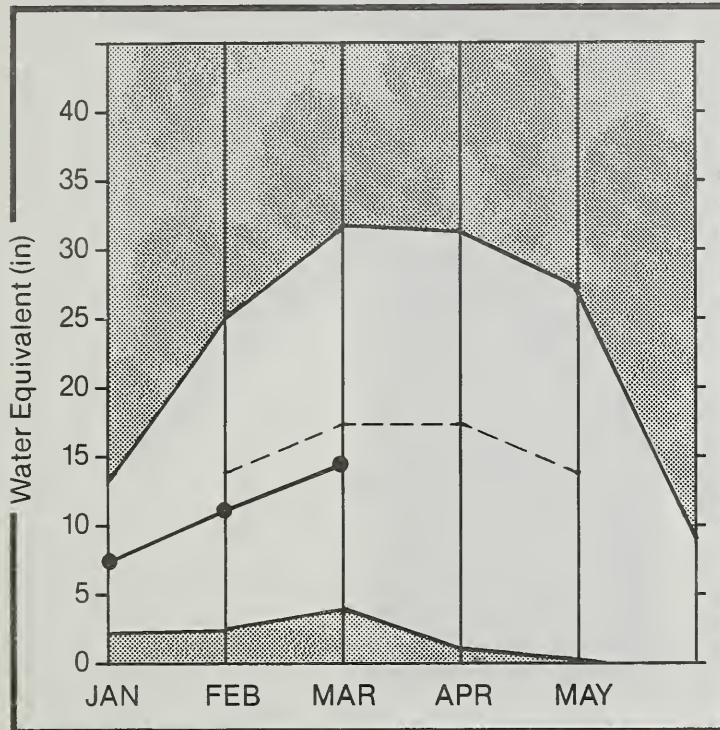
| RESERVOIR STORAGE (1000AF) |                  |           |                                    |      | WATERSHED SNOWPACK ANALYSIS |                   |                                       |    |
|----------------------------|------------------|-----------|------------------------------------|------|-----------------------------|-------------------|---------------------------------------|----|
| RESERVOIR                  | USEABLE CAPACITY | THIS YEAR | ** USEABLE STORAGE **<br>LAST YEAR | AVE. | WATERSHED                   | NO. COURSES AVE.D | THIS YEAR AS % OF<br>LAST YR. AVERAGE |    |
|                            |                  |           |                                    |      |                             |                   |                                       |    |
|                            |                  |           |                                    |      | Okanogan River              | 28                | 91                                    | 84 |
|                            |                  |           |                                    |      | Methow River                | 4                 | 92                                    | 83 |

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.



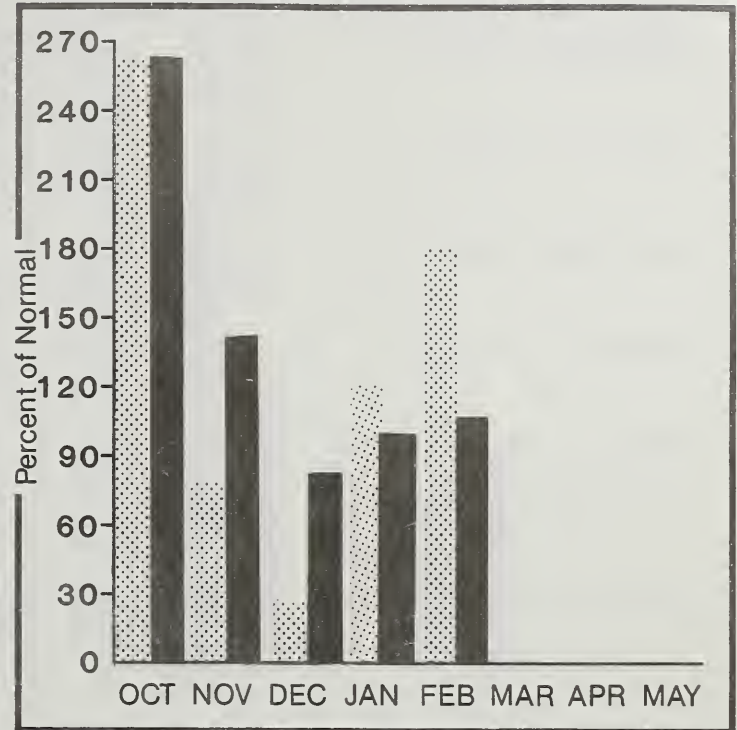
# WENATCHEE AND CHELAN

**Mountain snowpack\* (inches)**

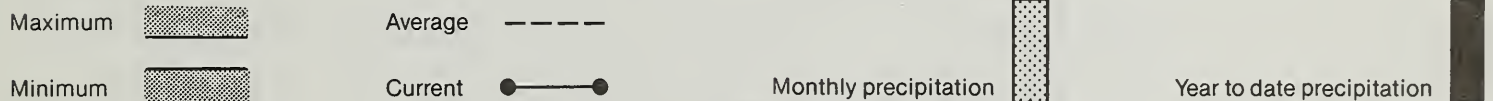


\*Based on selected stations

**Precipitation\* (percent of normal)**



\*Based on selected stations



## WENATCHEE - CHELAN RIVER BASINS

### WATER SUPPLY OUTLOOK:

Snowcover remained near the season norm with 103% in the Chelan, 96% in the Entiat and 91% for the Wenatchee Basin. Precipitation for February was 180% of normal, with Lake Wenatchee reporting 8.1 inches compared to an average of 3.38. February streamflow was above average with the Wenatchee at 126% and the Chelan at 114%. Storage in Chelan Lake was at 101% of the March 1st normal. Forecasted streamflow for the spring and summer are Chelan 98%, Entiat 95%, Wenatchee 95% and the Stemilt 95%.

For more information contact your local Soil Conservation Service office.

# WENATCHEE - CHELAN RIVER BASINS

## STREAMFLOW FORECASTS

| FORECAST POINT                   | FORECAST PERIOD | 20 YR. AVE. (1000AF) | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVE.) | REAS. MAX. (% AVE.) | REAS. MIN. (% AVE.) | PEAK FLOW (CFS) | PEAK DATE | LOW FLOW (CFS) | LOW DATE |
|----------------------------------|-----------------|----------------------|------------------------|------------------------|---------------------|---------------------|-----------------|-----------|----------------|----------|
| CHELAN RIVER at Chelan *         | APR-SEP         | 1203.0               | 1180.0                 | 98                     | 117                 | 79                  |                 |           |                |          |
|                                  | APR-JUL         | 1055.0               | 1030.0                 | 97                     | 117                 | 79                  |                 |           |                |          |
|                                  | APR-JUN         | 826.0                | 810.0                  | 98                     | 117                 | 79                  |                 |           |                |          |
| STEHEKIN R. at Stehekin          | APR-SEP         | 860.0                | 860.0                  | 100                    | 113                 | 87                  |                 |           |                |          |
|                                  | APR-JUL         | 727.0                | 727.0                  | 100                    | 113                 | 87                  |                 |           |                |          |
|                                  | APR-JUN         | 553.0                | 560.0                  | 101                    | 114                 | 88                  |                 |           |                |          |
| ENTIAT RIVER nr Ardenvoir        | APR-SEP         | 234.6                | 222.0                  | 94                     |                     |                     |                 |           |                |          |
|                                  | APR-JUL         | 213.0                | 202.0                  | 94                     |                     |                     |                 |           |                |          |
|                                  | APR-JUN         | 172.0                | 165.0                  | 95                     |                     |                     |                 |           |                |          |
| WENATCHEE RIVER at Plain         | APR-SEP         | 1270.0               | 1240.0                 | 97                     | 130                 | 66                  |                 |           |                |          |
|                                  | APR-JUL         | 1113.0               | 1090.0                 | 97                     | 130                 | 66                  |                 |           |                |          |
|                                  | APR-JUN         | 899.0                | 890.0                  | 98                     | 131                 | 67                  |                 |           |                |          |
| STEMILT nr Wenatchee (miners in) | MAY-SEP         | 138.0                | 132.0                  | 95                     |                     |                     |                 |           |                |          |
| ICICLE CREEK nr Leavenworth      | APR-SEP         | 370.0                | 350.0                  | 94                     |                     |                     |                 |           |                |          |
|                                  | APR-JUL         | 340.0                | 325.0                  | 95                     |                     |                     |                 |           |                |          |
|                                  | APR-JUN         | 270.0                | 262.0                  | 97                     |                     |                     |                 |           |                |          |
| COLUMBIA R. bl Rock Island Dam * | APR-SEP         | 72781.0              | 68800.0                | 94                     | 110                 | 80                  |                 |           |                |          |
|                                  | APR-JUL         | 61601.0              | 58300.0                | 94                     | 110                 | 80                  |                 |           |                |          |
|                                  | APR-JUN         | 48384.0              | 45900.0                | 94                     | 110                 | 80                  |                 |           |                |          |

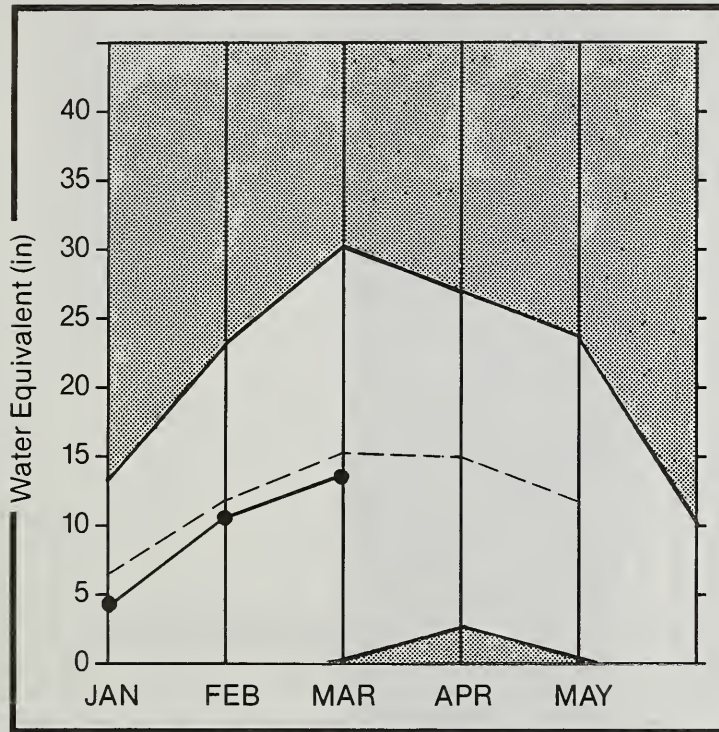
| RESERVOIR STORAGE |                     | (1000AF)              | WATERSHED SNOWPACK ANALYSIS |      |                   |                         |                   |         |
|-------------------|---------------------|-----------------------|-----------------------------|------|-------------------|-------------------------|-------------------|---------|
| RESERVOIR         | USEABLE<br>CAPACITY | ** USEABLE STORAGE ** |                             |      | WATERSHED         | NO.<br>COURSES<br>AVE.D | THIS YEAR AS % OF |         |
|                   |                     | THIS<br>YEAR          | LAST<br>YEAR                | AVE. |                   |                         | LAST YR.          | AVERAGE |
| CHELAN LAKE       | 576.1               | 238.4                 | 159.9                       |      | Chelan Lake Basin | 6                       | 125               | 96      |
|                   |                     |                       |                             |      | Entiat River      | 2                       | 128               | 97      |
|                   |                     |                       |                             |      | Wenatchee River   | 7                       | 88                | 92      |
|                   |                     |                       |                             |      | Colockum Creek    | 1                       | 89                | 76      |
|                   |                     |                       |                             |      | Squilchuck Creek  | 1                       | 141               | 108     |
|                   |                     |                       |                             |      | Stemilt Creek     | 1                       | 120               | 93      |

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.



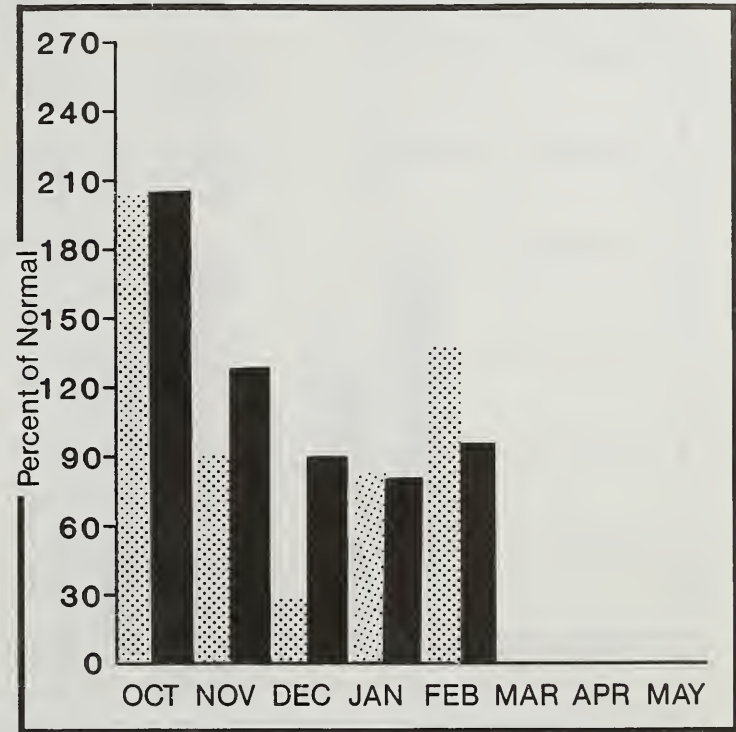
# YAKIMA

**Mountain snowpack\* (inches)**





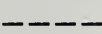

\*Based on selected stations



**Precipitation\* (percent of normal)**



\*Based on selected stations

Maximum   
Minimum 

Average   
Current 

Monthly precipitation  Year to date precipitation 

## YAKIMA RIVER BASIN

### WATER SUPPLY OUTLOOK:

Snowcover remained constant with 87% of average over the Yakima Basin. Streamflows are forecasted to be 91% on the Yakima and 95% on the Naches River. Precipitation for February was 134% of normal, with late month precipitation falling as rain. Reservoir storage is 80% of the 20 year average, with 560,000 acre feet in storage. Temperatures averaged 1 degree below average, with the last two weeks being above normal. Streamflow in the Yakima for February was 96% of average.

For more information contact your local Soil Conservation Service office.



# YAKIMA RIVER BASIN

## STREAMFLOW FORECASTS

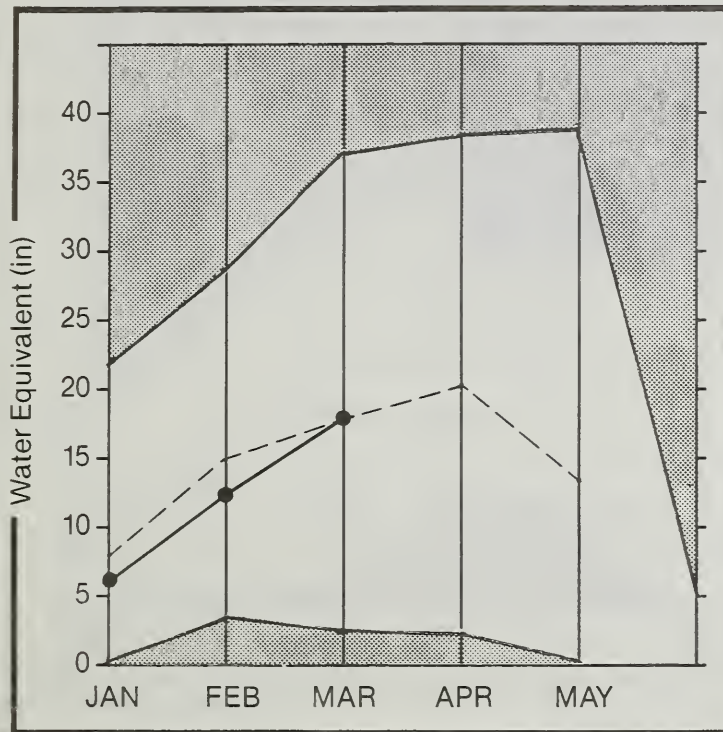
| FORECAST POINT             | FORECAST PERIOD | 20 YR. AVE. (1000AF) | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVE.) | REAS. MAX. (% AVE.) | REAS. MIN. (% AVE.) | PEAK FLOW (CFS) | PEAK DATE | LOW FLOW (CFS) | LOW DATE |
|----------------------------|-----------------|----------------------|------------------------|------------------------|---------------------|---------------------|-----------------|-----------|----------------|----------|
| YAKIMA RIVER at Martin *   | APR-SEP         | 139.0                | 126.0                  | 90                     | 102                 | 79                  |                 |           |                |          |
|                            | APR-JUL         | 128.0                | 116.0                  | 90                     | 102                 | 79                  |                 |           |                |          |
|                            | APR-JUN         | 111.0                | 102.0                  | 91                     | 103                 | 80                  |                 |           |                |          |
| YAKIMA RIVER at Cle Elum * | APR-SEP         | 943.0                | 849.0                  | 90                     | 101                 | 79                  |                 |           |                |          |
|                            | APR-JUL         | 854.0                | 770.0                  | 90                     | 101                 | 79                  |                 |           |                |          |
|                            | APR-JUN         | 734.0                | 670.0                  | 91                     | 102                 | 80                  |                 |           |                |          |
| YAKIMA RIVER nr Parker *   | APR-SEP         | 2096.0               | 1940.0                 | 92                     | 112                 | 74                  |                 |           |                |          |
|                            | APR-JUL         | 1898.0               | 1760.0                 | 92                     | 112                 | 74                  |                 |           |                |          |
|                            | APR-JUN         | 1667.0               | 1570.0                 | 94                     | 113                 | 75                  |                 |           |                |          |
| KACHESS RIVER nr Easton *  | APR-SEP         | 121.0                | 109.0                  | 90                     | 102                 | 79                  |                 |           |                |          |
|                            | APR-JUL         | 115.0                | 104.0                  | 90                     | 102                 | 79                  |                 |           |                |          |
|                            | APR-JUN         | 101.0                | 92.0                   | 91                     | 103                 | 80                  |                 |           |                |          |
| CLE ELUM RIVER nr Roslyn * | APR-SEP         | 463.0                | 426.0                  | 92                     | 103                 | 81                  |                 |           |                |          |
|                            | APR-JUL         | 422.0                | 390.0                  | 92                     | 103                 | 81                  |                 |           |                |          |
|                            | APR-JUN         | 353.0                | 330.0                  | 93                     | 104                 | 82                  |                 |           |                |          |
| BUMPING RIVER nr Nila *    | APR-SEP         | 142.0                | 135.0                  | 95                     | 116                 | 74                  |                 |           |                |          |
|                            | APR-JUL         | 129.0                | 123.0                  | 95                     | 116                 | 74                  |                 |           |                |          |
|                            | APR-JUN         | 107.0                | 103.0                  | 96                     | 117                 | 76                  |                 |           |                |          |
| AMERICAN RIVER nr Nila     | APR-SEP         | 124.0                | 118.0                  | 95                     | 116                 | 74                  |                 |           |                |          |
|                            | APR-JUL         | 113.0                | 107.0                  | 94                     | 116                 | 73                  |                 |           |                |          |
|                            | APR-JUN         | 94.0                 | 90.0                   | 95                     | 117                 | 74                  |                 |           |                |          |
| TIETON RIVER at Tieton *   | APR-SEP         | 246.0                | 237.0                  | 96                     | 117                 | 75                  |                 |           |                |          |
|                            | APR-JUL         | 207.0                | 198.0                  | 95                     | 117                 | 75                  |                 |           |                |          |
|                            | APR-JUN         | 165.0                | 160.0                  | 96                     | 118                 | 75                  |                 |           |                |          |
| NACHES RIVER nr Naches *   | APR-SEP         | 867.0                | 823.0                  | 94                     | 118                 | 72                  |                 |           |                |          |
|                            | APR-JUL         | 784.0                | 744.0                  | 94                     | 118                 | 72                  |                 |           |                |          |
|                            | APR-JUN         | 667.0                | 640.0                  | 95                     | 119                 | 73                  |                 |           |                |          |
| AHTANUM CREEK nr Timpico * | APR-SEP         | 47.0                 | 38.0                   | 80                     | 119                 | 43                  |                 |           |                |          |
|                            | APR-JUL         | 43.0                 | 34.8                   | 80                     | 119                 | 42                  |                 |           |                |          |
|                            | APR-JUN         | 37.0                 | 30.3                   | 81                     | 119                 | 43                  |                 |           |                |          |

| RESERVOIR STORAGE (1000AF) |                  |           |           |         | WATERSHED SNOWPACK ANALYSIS |                   |                            |              |
|----------------------------|------------------|-----------|-----------|---------|-----------------------------|-------------------|----------------------------|--------------|
| RESERVOIR                  | USEABLE CAPACITY | THIS YEAR | LAST YEAR | AVERAGE | WATERSHED                   | NO. COURSES AVE.D | THIS YEAR AS % OF LAST YR. | % OF AVERAGE |
| KEECHULUS                  | 157.8            | 81.9      | 83.5      | 105.0   | Yakima River                | 15                | 107                        | 86           |
| KACHESS                    | 239.0            | 128.6     | 154.4     | 179.0   | Ahtanum Creek               | 2                 | 139                        | 71           |
| CLE ELEM                   | 436.9            | 173.7     | 179.1     | 273.0   |                             |                   |                            |              |
| BUMPING LAKE               | 33.7             | 17.2      | 3.8       | 10.0    |                             |                   |                            |              |
| RIMROCK                    | 198.0            | 133.8     | 84.2      | 130.0   |                             |                   |                            |              |





\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

# WALLA WALLA

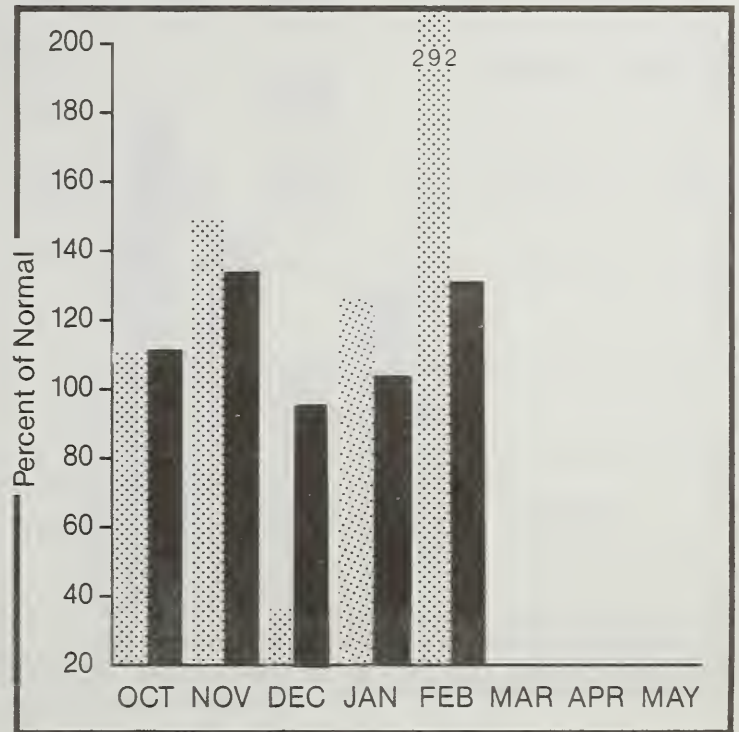
Mountain snowpack\* (inches)





\*Based on selected stations

Maximum  Average   
Minimum  Current 

Precipitation\* (percent of normal)



\*Based on selected stations

Monthly precipitation  Year to date precipitation 

## WALLA WALLA RIVER BASIN

### WATER SUPPLY OUTLOOK:

Streamflow in the Walla Walla River was 193% of normal for February. Precipitation for February was 292% of average, with temperatures normal for the month. Temperatures were above average for the last two weeks of February and along with the high precipitation caused much of the low elevation snow to melt. Streamflows are forecasted to be near normal with the Walla Walla River at 96% for the summer.

For more information contact your local Soil Conservation Service office.

# WALLA WALLA RIVER BASIN

## STREAMFLOW FORECASTS

| FORECAST POINT              | FORECAST PERIOD | 20 YR. AVE. (1000AF) | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVE.) | REAS. MAX. (% AVE.) | REAS. MIN. (% AVE.) | PEAK FLOW (CFS) | PEAK DATE | LOW FLOW (CFS) | LOW DATE |
|-----------------------------|-----------------|----------------------|------------------------|------------------------|---------------------|---------------------|-----------------|-----------|----------------|----------|
| MILL CREEK at Walla Walla   | APR-SEP         | 17.5                 | 16.8                   | 96                     | 126                 | 69                  |                 |           |                |          |
|                             | APR-JUL         | 17.3                 | 16.6                   | 95                     | 127                 | 69                  |                 |           |                |          |
|                             | APR-JUN         | 17.1                 | 16.5                   | 96                     | 122                 | 70                  |                 |           |                |          |
| COLUMBIA R. at The Dalles * | APR-SEP         | 101000.0             | 85000.0                | 94                     | 111                 | 77                  |                 |           |                |          |
|                             | APR-JUL         | 86500.0              | 81100.0                | 93                     | 111                 | 77                  |                 |           |                |          |
|                             | APR-JUN         | 70100.0              | 65900.0                | 94                     | 111                 | 77                  |                 |           |                |          |

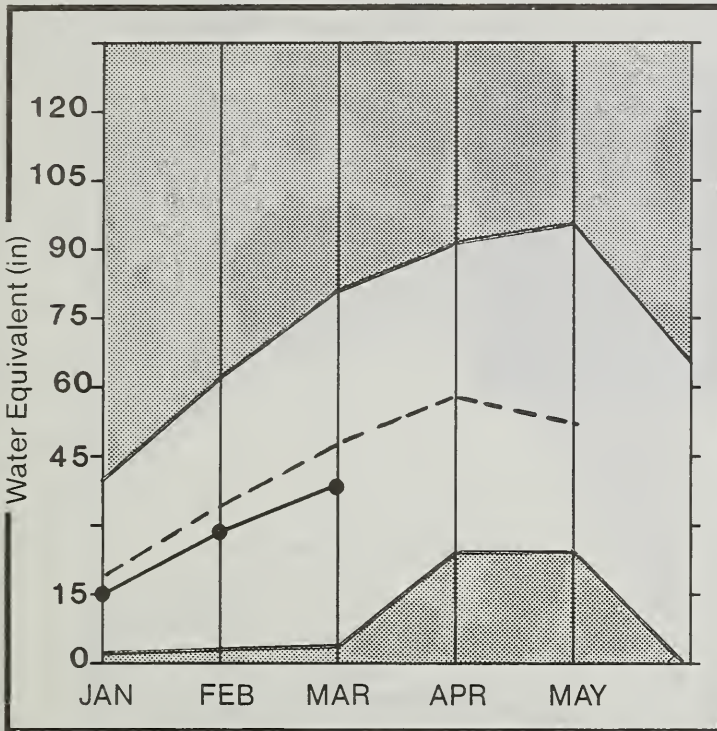
| RESERVOIR STORAGE (1000AF) |                  | WATERSHED SNOWPACK ANALYSIS |            |                   |                                    |
|----------------------------|------------------|-----------------------------|------------|-------------------|------------------------------------|
| RESERVOIR                  | USEABLE CAPACITY | ** USEABLE STORAGE **       | WATERSHED  | NO. COURSES AVE.D | THIS YEAR AS % OF LAST YR. AVERAGE |
|                            | THIS YEAR        | LAST YEAR AVE.              |            |                   |                                    |
|                            |                  |                             | Mill Creek | 1                 | 58 102                             |

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.







# COWLITZ AND LEWIS

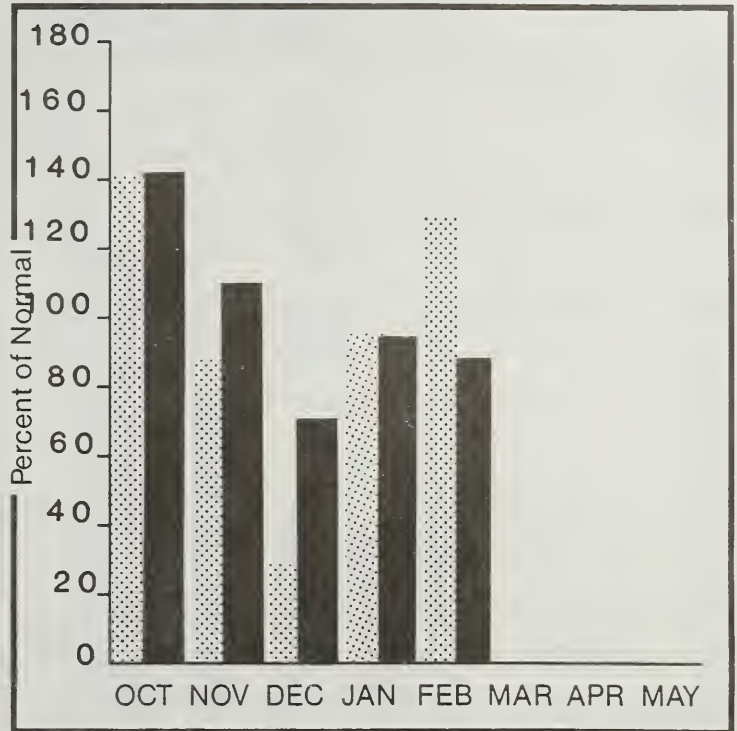
Mountain snowpack\* (inches)





\*Based on selected stations

Maximum  Average   
Minimum  Current 

Precipitation\* (percent of normal)



\*Based on selected stations

Monthly precipitation  Year to date precipitation 

## COWLITZ - LEWIS RIVER BASINS

### WATER SUPPLY OUTLOOK:

Streamflows are forecasted to be 85% on the Cowlitz River and 84% on the Lewis River this summer. February streamflow on the Cowlitz River was 136% of normal. Snowcover for the March 1st snow measurements were at 77% of normal down from the 94% of normal for February 1. Precipitation for February was 127% of average, with much of it falling as rain. Temperatures for the month were near normal.

For more information contact your local Soil Conservation Service office.

# COWLITZ - LEWIS RIVER BASINS

## STREAMFLOW FORECASTS

| FORECAST POINT               | FORECAST PERIOD | 20 YR. AVE.<br>(1000AF) | MOST PROBABLE<br>(1000AF) | MOST PROBABLE<br>(% AVE.) | REAS. MAX.<br>(% AVE.) | REAS. MIN.<br>(% AVE.) | PEAK FLOW<br>(CFS) | PEAK DATE | LOW FLOW<br>(CFS) | LOW DATE |
|------------------------------|-----------------|-------------------------|---------------------------|---------------------------|------------------------|------------------------|--------------------|-----------|-------------------|----------|
| LEWIS RIVER at Ariel *       | APR-SEP         | 1249.0                  | 1050.0                    | 84                        | 114                    | 54                     |                    |           |                   |          |
|                              | APR-JUL         | 1086.0                  | 912.0                     | 83                        | 114                    | 54                     |                    |           |                   |          |
|                              | APR-JUN         | 961.0                   | 820.0                     | 85                        | 115                    | 55                     |                    |           |                   |          |
| COWLITZ R. bl Mayfield Dam * | APR-SEP         | 2038.0                  | 1670.0                    | 81                        | 120                    | 40                     |                    |           |                   |          |
|                              | APR-JUL         | 1778.0                  | 1460.0                    | 82                        | 120                    | 40                     |                    |           |                   |          |
|                              | APR-JUN         | 1502.0                  | 1250.0                    | 83                        | 121                    | 41                     |                    |           |                   |          |
| COWLITZ R. at Castle Rock *  | APR-SEP         | 2673.0                  | 2270.0                    | 84                        | 120                    | 50                     |                    |           |                   |          |
|                              | APR-JUL         | 2323.0                  | 1975.0                    | 83                        | 120                    | 50                     |                    |           |                   |          |
|                              | APR-JUN         | 1980.0                  | 1710.0                    | 86                        | 121                    | 51                     |                    |           |                   |          |

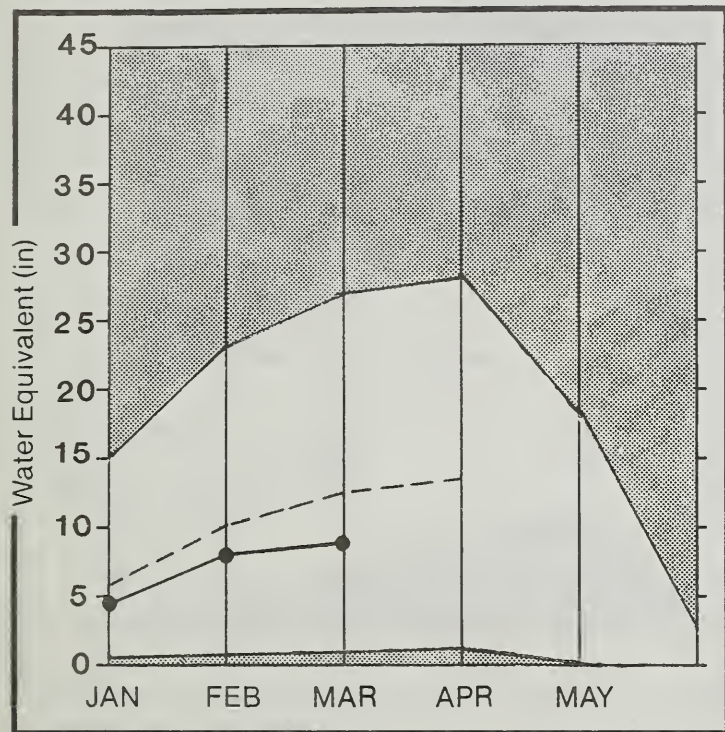
| RESERVOIR STORAGE<br>(1000AF) |                  |                       |           |      | WATERSHED SNOWPACK ANALYSIS |                   |                   |         |
|-------------------------------|------------------|-----------------------|-----------|------|-----------------------------|-------------------|-------------------|---------|
| RESERVOIR                     | USEABLE CAPACITY | ** USEABLE STORAGE ** |           |      | WATERSHED                   | NO. COURSES AVE.D | THIS YEAR AS % OF |         |
|                               |                  | THIS YEAR             | LAST YEAR | AVE. |                             |                   | LAST YR.          | AVERAGE |
|                               |                  |                       |           |      | Cowlitz River               | 2                 | 105               | 74      |
|                               |                  |                       |           |      | Lewis River                 | 2                 | 82                | 90      |

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.



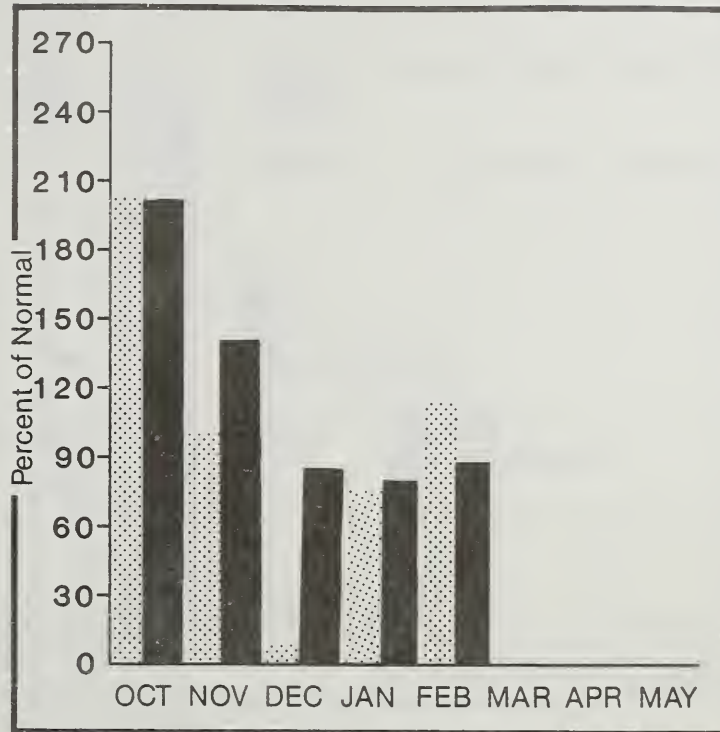
# WHITE - GREEN

Mountain snowpack\* (inches)







\*Based on selected stations


Precipitation\* (percent of normal)




\*Based on selected stations

Maximum   
Minimum 

Average   
Current 

Monthly precipitation 

Year to date precipitation 

## WHITE - GREEN RIVER BASINS

### WATER SUPPLY OUTLOOK:

Snowcover continued to be below average in the Green and Cedar Rivers with 66% and 43% of normal. The White River is only slightly better with 85% of average. Streamflows were above average for February and the forecasted streamflows are 80% for the Green River and 83% for the Cedar River. Precipitation for February was 116% of normal, with temperatures near average for the month.

For more information contact your local Soil Conservation Service office.



# WHITE - GREEN RIVER BASINS

## STREAMFLOW FORECASTS

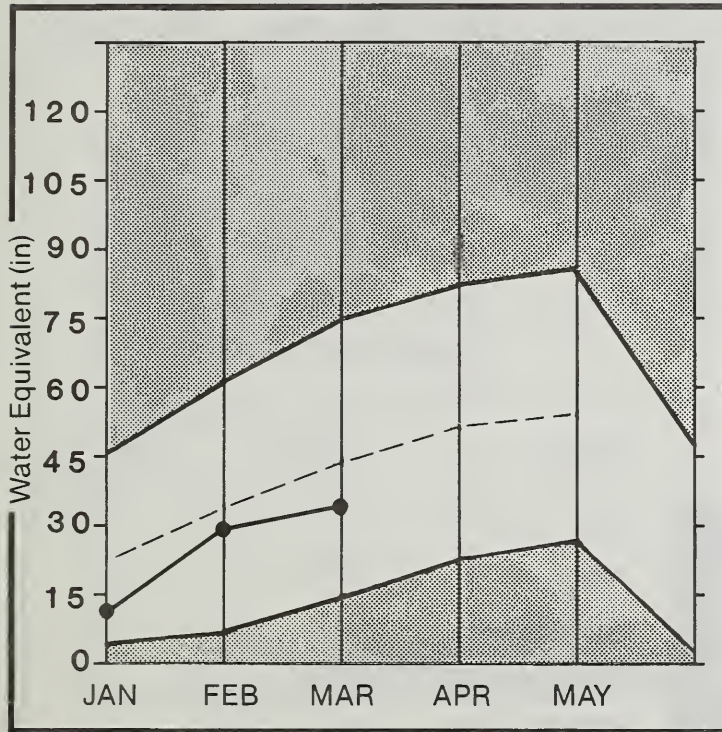
| FORECAST POINT                     | FORECAST PERIOD | 20 YR. AVE. (1000AF) | MOST PROBABLE (1000AF) | MOST PROBABLE (% AVE.) | REAS. MAX. (% AVE.) | REAS. MIN. (% AVE.) | PEAK FLOW (CFS) | PEAK DATE | LOW FLOW (CFS) | LOW DATE |
|------------------------------------|-----------------|----------------------|------------------------|------------------------|---------------------|---------------------|-----------------|-----------|----------------|----------|
| GREEN RIVER bl Howard Hanson Dam * | APR-SEP         | 316.0                | 255.0                  | 80                     |                     |                     |                 |           |                |          |
|                                    | APR-JUL         | 284.0                | 230.0                  | 80                     |                     |                     |                 |           |                |          |
|                                    | APR-JUN         | 256.0                | 210.0                  | 82                     |                     |                     |                 |           |                |          |
| CEDAR RIVER nr Cedar Falls         | APR-SEP         | 93.0                 | 77.0                   | 82                     |                     |                     |                 |           |                |          |

| RESERVOIR STORAGE |                  | (1000AF)              | WATERSHED SNOWPACK ANALYSIS |                   |                   |         |
|-------------------|------------------|-----------------------|-----------------------------|-------------------|-------------------|---------|
| RESERVOIR         | USEABLE CAPACITY | ** USEABLE STORAGE ** | WATERSHED                   | NO. COURSES AVE.D | THIS YEAR AS % OF |         |
|                   | THIS YEAR        | LAST YEAR AVE.        |                             |                   | LAST YR.          | AVERAGE |
|                   |                  |                       | White River                 | 2                 | 112               | 77      |
|                   |                  |                       | Green River                 | 9                 | 47                | 64      |

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

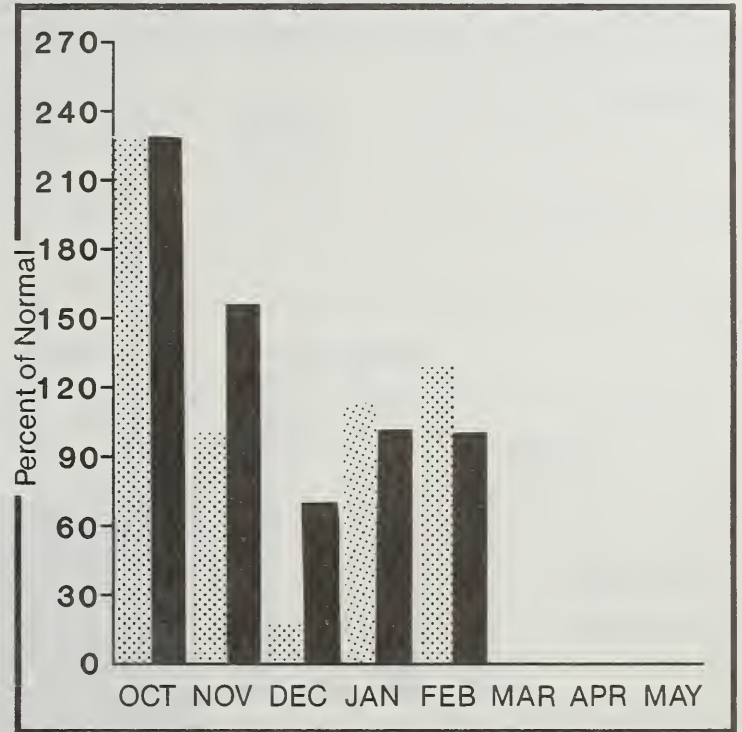
# NORTH PUGET SOUND

Mountain snowpack\* (inches)







\*Based on selected stations

Precipitation\* (percent of normal)



\*Based on selected stations

Maximum  Average   
Minimum  Current 

Monthly precipitation  Year to date precipitation 

## NORTH PUGET SOUND RIVER BASINS

### WATER SUPPLY OUTLOOK:

Snowcover remained much the same as last month with the Skagit River at 90% of average and the Baker River at 66%. Streamflows are forecasted to be 85% of average on the Skagit. February precipitation was 128% of normal for the North Puget Sound, with Diablo Dam receiving 11.87 inches for the month. Streamflow for February was 159% of average for the Skykomish River. Reservoir storage in Ross, Diablo and Gorge was at 97% of normal.

For more information contact your local Soil Conservation Service office.

# NORTH PUGET SOUND RIVER BASINS

## STREAMFLOW FORECASTS

| FORECAST POINT             | FORECAST<br>PERIOD | 20 YR.<br>AVE.<br>(1000AF) | MOST<br>PROBABLE<br>(1000AF) | MOST<br>PROBABLE<br>(% AVE.) | REAS.<br>MAX.<br>(% AVE.) | REAS.<br>MIN.<br>(% AVE.) | PEAK<br>FLOW<br>(CFS) | PEAK<br>DATE | LOW<br>FLOW<br>(CFS) | LOW<br>DATE |
|----------------------------|--------------------|----------------------------|------------------------------|------------------------------|---------------------------|---------------------------|-----------------------|--------------|----------------------|-------------|
| SKAGIT RIVER at Newhalem * | APR-SEP            | 2356.0                     | 2000.0                       | 84                           | 103                       | 67                        |                       |              |                      |             |
|                            | APR-JUL            | 1972.0                     | 1680.0                       | 85                           | 103                       | 67                        |                       |              |                      |             |
|                            | APR-JUN            | 1485.0                     | 1270.0                       | 85                           | 104                       | 68                        |                       |              |                      |             |

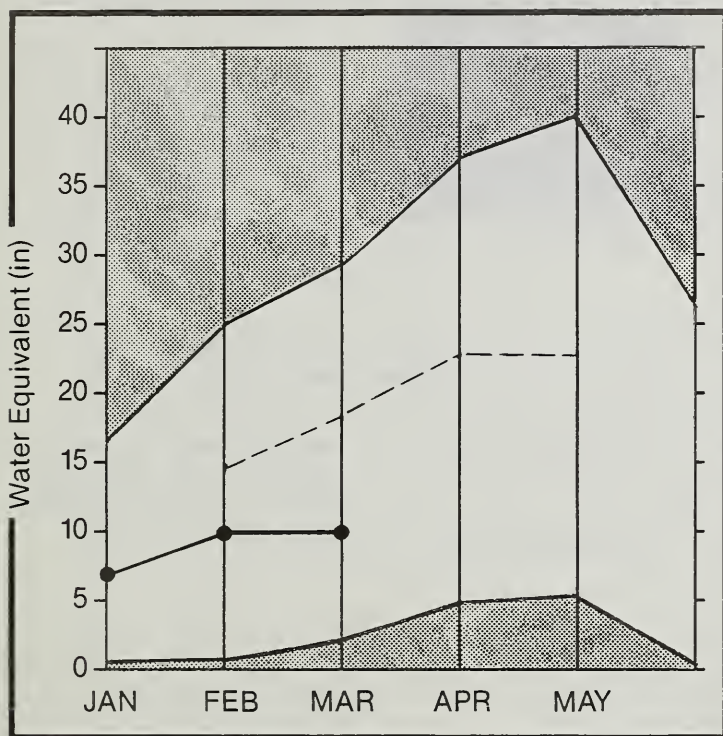
| RESERVOIR STORAGE |                       | (1000AF)              |              |      | WATERSHED SNOWPACK ANALYSIS |                         |                   |         |
|-------------------|-----------------------|-----------------------|--------------|------|-----------------------------|-------------------------|-------------------|---------|
| RESERVOIR         | USEABLE  <br>CAPACITY | ** USEABLE STORAGE ** |              |      | WATERSHED                   | NO.<br>COURSES<br>AVE.D | THIS YEAR AS % OF |         |
|                   |                       | THIS<br>YEAR          | LAST<br>YEAR | AVE. |                             |                         | LAST YR.          | AVERAGE |
| ROSS              | 1404.1                | 869.2                 | 684.3        | ---  | Skagit River                | 14                      | 101               | 91      |
| DIABLO RESERVOIR  | 90.6                  | 85.6                  | 84.9         | ---  | Baker River                 | 9                       | 64                | 63      |
| GORGE RESERVOIR   | 9.8                   | 7.6                   | 7.9          | ---  | Cedar River                 | 2                       | 32                | 43      |
|                   |                       |                       |              |      | Snoqualmie River            | 1                       | 89                | 82      |
|                   |                       |                       |              |      | Skykomish River             | 2                       | 74                | 72      |

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.



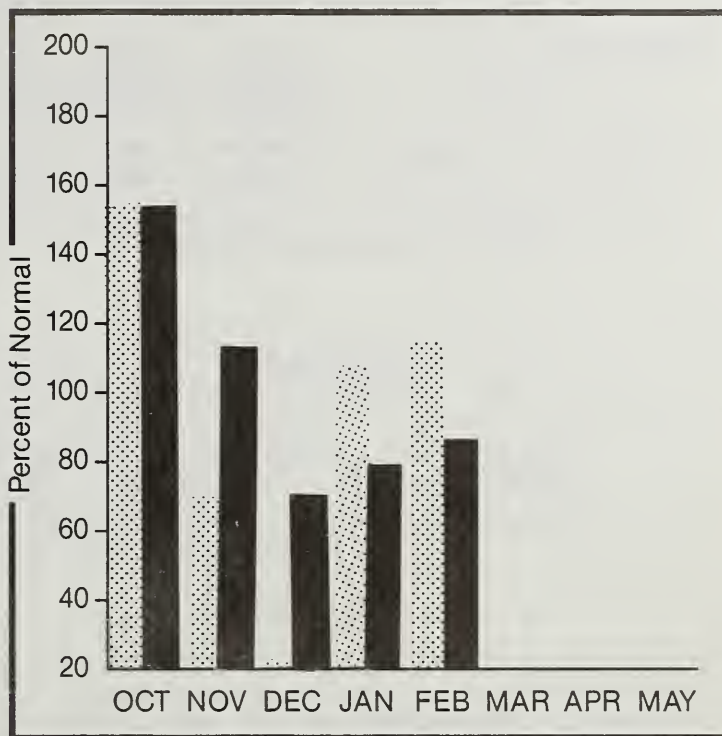
# OLYMPIC

Mountain snowpack\* (inches)



\*Based on selected stations

Precipitation\* (percent of normal)



\*Based on selected stations

Maximum



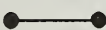
Average



Minimum



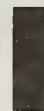
Current



Monthly precipitation



Year to date precipitation



## OLYMPIC PENINSULA RIVER BASINS

### WATER SUPPLY OUTLOOK:

Snowcover in the Olympic Peninsula remained much below average, with the Elwa at 50%, the Dungeness at 64% and Morse Creek at 78%. Streamflows are forecasted to be 75% of normal for the summer. Precipitation was 115% of normal for February with the Quillayute Airport having 12.27 inches of moisture. The water year total is now 86% of normal up from 79% last month.

For more information contact your local Soil Conservation Service office.

# OLYMPIC PENINSULA RIVER BASINS

## STREAMFLOW FORECASTS

| FORECAST POINT              | FORECAST PERIOD | 20 YR. AVE.<br>(1000AF) | MOST PROBABLE<br>(1000AF) | MOST PROBABLE<br>(% AVE.) | REAS. MAX.<br>(% AVE.) | REAS. MIN.<br>(% AVE.) | PEAK FLOW<br>(CFS) | PEAK DATE | LOW FLOW<br>(CFS) | LOW DATE |
|-----------------------------|-----------------|-------------------------|---------------------------|---------------------------|------------------------|------------------------|--------------------|-----------|-------------------|----------|
| DUNGENESS RIVER nr Sequim   | APR-SEP         | 160.0                   | 120.0                     | 75                        | 93                     | 57                     |                    |           |                   |          |
|                             | APR-JUL         | 130.0                   | 97.5                      | 75                        | 93                     | 57                     |                    |           |                   |          |
|                             | APR-JUN         | 97.0                    | 72.8                      | 75                        | 93                     | 57                     |                    |           |                   |          |
| ELWHA RIVER nr Port Angeles | APR-SEP         | 553.0                   | 414.0                     | 74                        |                        |                        |                    |           |                   |          |
|                             | APR-JUL         | 454.0                   | 340.0                     | 74                        |                        |                        |                    |           |                   |          |

| RESERVOIR STORAGE |                  | (1000AF)              | WATERSHED SNOWPACK ANALYSIS |                   |                   |         |
|-------------------|------------------|-----------------------|-----------------------------|-------------------|-------------------|---------|
| RESERVOIR         | USEABLE CAPACITY | ** USEABLE STORAGE ** | WATERSHED                   | NO. COURSES AVE.D | THIS YEAR AS % OF |         |
|                   | THIS YEAR        | LAST YEAR AVE.        |                             |                   | LAST YR.          | AVERAGE |
|                   |                  |                       | Dungeness River             | 1                 | 60                | 64      |
|                   |                  |                       | Horse Creek                 | 1                 | 73                | 79      |
|                   |                  |                       | Elwha River                 | 1                 | 55                | 50      |

\*Corrected for upstream diversions or changes in reservoir storage.  
Average is for 1961-80 period.

## RESERVOIR OPERATION MANAGEMENT PROGRAM

The Soil Conservation Service can develop a Reservoir Operation and Management plan for cooperators with the Soil Conservation Districts in Washington. If you are operating a reservoir for irrigation water supply, power generation or other use this may be of some value to you.

Selecting appropriate storage and release rates for reservoirs in snowmelt runoff environments is a prerequisite to sound water management. A significant number of small impoundments, operated for single or multiple purpose use in the Western United States, lack adequate management tools to guide this process each year. A methodology has been developed and approved to use seasonal volume forecasts issued by Soil Conservation Service to improve management capability at many of these reservoirs.

The technique involves generating a family of simple rule curves for each forecast period. These curves permit operators to use predicted inflow volume to set target outflow rates that will enable them to reach a full reservoir after passage of the seasonal peak. Forecasts at three probability levels help establish the range of likely seasonal runoff events. The rule curves provide an operational tool useful for developing effective water management plans for reservoirs where forecast information is available.



Snow Survey data can be obtained by calling one of the following local SCS offices:

PULLMAN PMC      Office (509) 335-7376  
                          Farm    (509) 335-9689

OLYMPIA, Area I

|              |       |                  |
|--------------|-------|------------------|
| Area Office  | FTS   | 434-9454 or 9455 |
| Chehalis     | (206) | 748-0083         |
| Kelso        | (206) | 425-1880         |
| Lake Stevens | FTS   | 392-9259         |
| Lynden       | (206) | 354-5658         |
| Montesano    | (206) | 249-5900         |
| Mt. Vernon   | (206) | 424-5153         |
| Olympia FO   | FTS   | 434-9448         |
| Port Angeles | FTS   | 396-4277         |
| Port Orchard | (206) | 876-5529         |
| Puyallup     | (206) | 845-5533         |
| Raymond      | (206) | 942-5945         |
| Renton       | FTS   | 399-3325 or 3326 |
| Vancouver    | FTS   | 422-7631         |

EPHRATA, AREA II

|             |       |                      |
|-------------|-------|----------------------|
| Area Office | FTS   | 446-4374 or 4375     |
| Davenport   | (509) | 725-4181 or 725-1345 |
| Ephrata FO  | FTS   | 446-4385             |
| Moses Lake  | (509) | 765-3261             |
| Okanogan    | (509) | 422-2750             |
| Othello     | (509) | 488-2802             |
| Ritzville   | (509) | 659-0254             |
| Waterville  | (509) | 745-8362             |
| Wenatchee   | FTS   | 390-0242 or 0260     |

YAKIMA, AREA III

|              |       |                  |
|--------------|-------|------------------|
| Area Office  | FTS   | 446-5865 or 5866 |
| Ellensburg   | (509) | 925-5375         |
| Goldendale   | (509) | 773-5823         |
| Pasco        | (509) | 545-8546 or 8547 |
| Prosser      | (509) | 786-1923         |
| Sunnyside    | (509) | 837-7911         |
| Toppenish    | (509) | 865-4012         |
| Walla Walla  | FTS   | 434-6340         |
| White Salmon | (509) | 493-1936         |
| Yakima FO    | FTS   | 446-5909         |

SPOKANE, AREA IV

|             |       |                    |
|-------------|-------|--------------------|
| Area Office | FTS   | 439-3726           |
| Cheney      | (509) | 458-6200, Ext 2309 |
| Clarkston   | (509) | 758-8012           |
| Colfax      | (509) | 397-4636           |
| Colville    | (509) | 684-5067           |
| Dayton      | (509) | 382-2351           |
| Fairfield   | (509) | 283-2331           |
| Newport     | (509) | 447-4217           |
| Pomeroy     | (509) | 843-1998           |
| Republic    | (509) | 775-3473           |
| Spokane FO  | FTS   | 439-2120           |

SOIL SURVEY OFFICES

|            |       |          |
|------------|-------|----------|
| Bellingham | (206) | 676-3520 |
| Inchelium  | (509) | 722-4395 |
| Nespelem   | FTS   | 439-9431 |
| Wapato     | (509) | 877-4004 |







# The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

**Canada:**

Ministry of the Environment, Water  
Investigations Branch, Victoria, British Columbia

**States:**

Washington State Department of Ecology  
Washington State Department of Natural Resources

**Federal:**

Department of the Army  
Corps of Engineers  
U.S. Department of Agriculture  
Forest Service  
U.S. Department of Commerce  
NOAA, National Weather Service  
U.S. Department of the Interior  
Bonneville Power Administration  
Bureau of Reclamation  
Geological Survey  
National Park Service

**Local:**

City of Tacoma  
City of Seattle  
Chelan County P.U.D.  
Pacific Power and Light Company  
Puget Sound Power and Light Company  
Washington Water Power Company  
Snohomish County P.U.D.

**Private:**

Okanogan Irrigation District  
Wenatchee Heights Irrigation District  
Newman Lake Homeowners Association

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
ROOM 360, U.S. COURT HOUSE  
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